



60047 U.S. PTO

08/803814

PATENT



02/24/97

Attorney's Docket No. 466-006903-US (PAR)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Lasse Siitonen
Risto Ronkka

WARNING: Patent must be applied for in the name(s) of all of the actual inventor(s). 37 CFR 1.41(a) and 1.53(b).

For (title):

A Personal Digital Assistant With
Real Time Search Capability

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this New Application Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date 2/24/97, in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number EM 029 040 054 US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Jaime McElhill

(type or print name of person mailing paper)

Signature of person mailing paper

NOTE: Each paper or fee referred to as enclosed herein has the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 CFR 1.10(b).

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 CFR 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

08/803814-1

1. Type of Application

This new application is for a(n)

(check one applicable item below)

☒ Original (nonprovisional)

☐ Design

☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach **ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED** and a **NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION**.

☐ Divisional.

☐ Continuation.

☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. 119(e), 120, or 121)

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach **ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED**.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. 120, 121 or 365(c). (35 U.S.C. 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

WARNING: When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

☐ The new application being transmitted claims the benefit of prior U.S. application(s) and enclosed are **ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED**.

3. Papers Enclosed That Are Required for Filing Date under 37 CFR 1.53(b) (Regular) or 37 CFR 1.153 (Design) Application

20 Pages of specification

5 Pages of claims

1 Pages of Abstract

10 Sheets of drawing

☐ formal

☒ informal

Table 1. Demographic characteristics of the study population	
Age (years)	Mean ± SD
18-24	21.5 ± 2.5
25-34	29.5 ± 3.5
35-44	39.5 ± 4.5
45-54	49.5 ± 5.5
55-64	59.5 ± 6.5
65-74	69.5 ± 7.5
75-84	79.5 ± 8.5
85-94	89.5 ± 9.5
95-104	99.5 ± 10.5
105-114	109.5 ± 11.5
115-124	119.5 ± 12.5
125-134	129.5 ± 13.5
135-144	139.5 ± 14.5
145-154	149.5 ± 15.5
155-164	159.5 ± 16.5
165-174	169.5 ± 17.5
175-184	179.5 ± 18.5
185-194	189.5 ± 19.5
195-204	199.5 ± 20.5
205-214	209.5 ± 21.5
215-224	219.5 ± 22.5
225-234	229.5 ± 23.5
235-244	239.5 ± 24.5
245-254	249.5 ± 25.5
255-264	259.5 ± 26.5
265-274	269.5 ± 27.5
275-284	279.5 ± 28.5
285-294	289.5 ± 29.5
295-304	299.5 ± 30.5
305-314	309.5 ± 31.5
315-324	319.5 ± 32.5
325-334	329.5 ± 33.5
335-344	339.5 ± 34.5
345-354	349.5 ± 35.5
355-364	359.5 ± 36.5
365-374	369.5 ± 37.5
375-384	379.5 ± 38.5
385-394	389.5 ± 39.5
395-404	399.5 ± 40.5
405-414	409.5 ± 41.5
415-424	419.5 ± 42.5
425-434	429.5 ± 43.5
435-444	439.5 ± 44.5
445-454	449.5 ± 45.5
455-464	459.5 ± 46.5
465-474	469.5 ± 47.5
475-484	479.5 ± 48.5
485-494	489.5 ± 49.5
495-504	499.5 ± 50.5
505-514	509.5 ± 51.5
515-524	519.5 ± 52.5
525-534	529.5 ± 53.5
535-544	539.5 ± 54.5
545-554	549.5 ± 55.5
555-564	559.5 ± 56.5
565-574	569.5 ± 57.5
575-584	579.5 ± 58.5
585-594	589.5 ± 59.5
595-604	599.5 ± 60.5
605-614	609.5 ± 61.5
615-624	619.5 ± 62.5
625-634	629.5 ± 63.5
635-644	639.5 ± 64.5
645-654	649.5 ± 65.5
655-664	659.5 ± 66.5
665-674	669.5 ± 67.5
675-684	679.5 ± 68.5
685-694	689.5 ± 69.5
695-704	699.5 ± 70.5
705-714	709.5 ± 71.5
715-724	719.5 ± 72.5
725-734	729.5 ± 73.5
735-744	739.5 ± 74.5
745-754	749.5 ± 75.5
755-764	759.5 ± 76.5
765-774	769.5 ± 77.5
775-784	779.5 ± 78.5
785-794	789.5 ± 79.5
795-804	799.5 ± 80.5
805-814	809.5 ± 81.5
815-824	819.5 ± 82.5
825-834	829.5 ± 83.5
835-844	839.5 ± 84.5
845-854	849.5 ± 85.5
855-864	859.5 ± 86.5
865-874	869.5 ± 87.5
875-884	879.5 ± 88.5
885-894	889.5 ± 89.5
895-904	899.5 ± 90.5
905-914	909.5 ± 91.5
915-924	919.5 ± 92.5
925-934	929.5 ± 93.5
935-944	939.5 ± 94.5
945-954	949.5 ± 95.5
955-964	959.5 ± 96.5
965-974	969.5 ± 97.5
975-984	979.5 ± 98.5
985-994	989.5 ± 99.5
995-1004	999.5 ± 100.5
1005-1014	1009.5 ± 101.5
1015-1024	1019.5 ± 102.5
1025-1034	1029.5 ± 103.5
1035-1044	1039.5 ± 104.5
1045-1054	1049.5 ± 105.5
1055-1064	1059.5 ± 106.5
1065-1074	1069.5 ± 107.5
1075-1084	1079.5 ± 108.5
1085-1094	1089.5 ± 109.5
1095-1104	1099.5 ±

(complete the following, if applicable)

4. Additional papers enclosed

- ## 5. Declaration or oath

- (check all applicable boxes)

- WARNING:** Where the filing is a completion in the U.S. of an International Application, but where a declaration is not available, or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

- ☐ Application is made by a person authorized under 37 CFR 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 CFR 1.16(e) can be filed subsequently).

NOTE: It is important that all the correct inventor(s) are named for filing under 37 CFR 1.41(c) and 1.53(b).

- ☐ Showing that the filing is authorized.
(not required unless called into question. 37 CFR 1.41(d))

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

- ☐ The same.

or

- ☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,
☐ is submitted.
☐ will be submitted.

7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. A verified English translation of the non-English language application and the processing fee of \$130.00 required by 37 CFR 1.17(k) is required to be filed with the application, or within such time as may be set by the Office. 37 CFR 1.52(d).

NOTE: A non-English oath or declaration in the form provided or approved by the PTO need not be translated. 37 CFR 1.69(b).

- ☒ English
☐ Non-English
☐ The attached translation is a verified translation. 37 CFR 1.52(d).

8. Assignment

- ☒ An assignment of the invention to Nokia Mobile Phones Limited

- ☒ is attached. A separate ☒ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

- ☐ will follow.

NOTE: "If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

WARNING: A newly executed "CERTIFICATE UNDER 37 CFR 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.

9. Certified Copy

Certified copy(ies) of application(s)

country	appln. no.	filed
country	appln. no.	filed
country	appln. no.	filed

from which priority is claimed

- ☐ is (are) attached.
☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 CFR 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 CFR 1.16)

A. ☒ Regular application

CLAIMS AS FILED			
Number filed	Number Extra	Rate	Basic Fee 37 CFR 1.16(a)
			\$750.00 \$770.00
Total			
Claims (37 CFR 1.16(c)) 11 - 20 =	0	×	\$ 22.00
Independent			\$80.00
Claims (37 CFR 1.16(b)) 3 - 3 =	0	×	\$78.00
Multiple dependent claim(s), if any (37 CFR 1.16(d))		+	\$250.00

- ☐ Amendment cancelling extra claims enclosed.
☐ Amendment deleting multiple-dependencies enclosed.
☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 CFR 1.16(d).

Filing Fee Calculation

\$ 770.00

- B. ☐ Design application
(\$310.00—37 CFR 1.16(f))

Filing Fee Calculation

\$ _____

- C. ☐ Plant application
(\$510.00—37 CFR 1.16(g))

Filing fee calculation

\$ _____

11. Small Entity Statement(s)

- ☐ Verified Statement(s) that this is a filing by a small entity under 37 CFR 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121 or 365(c) of a prior application may rely on a verified statement filed in the prior application if the nonprovisional application includes a reference to a verified statement in the prior application or includes a copy of the verified statement filed in the prior application if status as a small entity is still proper and desired." 37 C.F.R. § 1.28(a).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application
_____ / _____, filed on _____, from which benefit
is being claimed for this application under:

35 U.S.C. ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the verified statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ _____

NOTE: Any excess of the full fee paid will be refunded if a verified statement and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136. 37 CFR 1.28(a).

12. Request for International-Type Search (37 CFR 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 CFR 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Basic filing fee \$ 770.00

☒ Recording assignment
(\$40.00; 37 CFR 1.21(h))
(See attached "COVER SHEET FOR
ASSIGNMENT ACCOMPANYING NEW
APPLICATION".) \$ 40.00

☐ Petition fee for filing by other than all the
inventors or person on behalf of the inventor
where inventor refused to sign or cannot be
reached.
(\$130.00; 37 CFR 1.47 and 1.17(h)) \$

☐ For processing an application with a
specification in
a non-English language. (\$130.00; 37 CFR
1.52(d) and 1.17(k)) \$

☐ Processing and retention fee
(\$130.00; 37 CFR 1.53(d) and 1.21(l)) \$

☐ Fee for international-type search report
(\$40.00; 37 CFR 1.21(e)) \$

NOTE: 37 CFR 1.21(l) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 CFR 1.53(d) and this, as well as the changes to 37 CFR 1.53 and 1.78, indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(l) must be paid, within 1 year from notification under § 53(d).

Total fees enclosed \$ 810.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 810.00

☐ Charge Account No. _____ in the amount of \$ _____
A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 CFR 1.22(b).

15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing, the following items should not be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 16-1350:

☒ 37 CFR 1.16(a), (f) or (g) (filing fees)

☒ 37 CFR 1.16(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 CFR 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☒ 37 CFR 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 CFR 1.17 (application processing fees)

WARNING: While 37 CFR 1.17(a), (b), (c) and (d) deal with extensions of time under § 1.136(a), this authorization should be made only with the knowledge that: "Submission of the appropriate extension fee under 37 C.F.R. 1.136(a) is to no avail unless a request or petition for extension is filed." (Emphasis added), Notice of November 5, 1985 (1060 O.G. 27).

☐ 37 CFR 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 CFR 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 CFR 1.311(b).

NOTE: 37 CFR 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . issue fee." From the wording of 37 CFR 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

16. Instructions as to Overpayment

☒ Credit Account No. 16-1350

☐ Refund

Reg. No. 32,493

Tel. No. (203) 259-1800


SIGNATURE OF ATTORNEY

Harry F. Smith

(type or print name of attorney)

Perman & Green, LLP

P.O. Address

425 Post Road, Fairfield, CT 06430

(Application Transmittal [4-1]—page 8 of 9)

0880344-0249

☐ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added _____

- ☐ Plus Added Pages for Papers Referred to in Item 4 .Above

Number of pages added _____

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added _____

☒ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item.)

- ☒ This transmittal ends with this page.



770-101 A

Express Mail No. EM 029 040 054 US

Nokia Mobile Phones Limited Docket No.: 12575

Perman & Green, LLP Docket No.: 466-006903-US (PAR)

5 Patent Application Papers of: Lasse Siitonen,
Risto Rönkkä

A PERSONAL DIGITAL ASSISTANT WITH
REAL TIME SEARCH CAPABILITY

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FIELD OF THE INVENTION

The present invention relates to the field of data base
searching used in connection with personal digital
15 assistants and electronic communications.

BACKGROUND OF THE INVENTION

Advanced communications systems have brought portable
20 radiotelephony to countless subscribers throughout the
world by combining many technologies such as high
frequency semiconductors, computer and communications
technology. As the technology matures it opens
opportunities for expanded services such as personal
25 digital assistants.

The personal digital assistant (PDA) is essentially a
portable electronic computer having specialized
capabilities. The PDA comes in several varieties such as
30 message pads, palm top computers and those that combine
PDA's with communications units. Generally, PDA's do not
have self contained phone units, however, a user may still
send telefaxes, electronic mail(E-mail), voice mail and
voice telephone calls. Some PDA's can be directly
35 connected to a the Public Switched Telephone Network(PSTN)
whereas others may require an adapter such as a PCMCIA
card. It is a common practice to include features such as
calculators, calendars, memorandum pads and personal and
business directories or calling card file information.

000034-0249

PDA's that contain such information utilize conventional computer storage facilities and retain such information in non-volatile memory storage devices such as random access memory, tape storage, and magnetic disk storage.

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Regardless of the particular data storage technology, the information is accessible to the user of the PDA's through conventional display technology, such as a liquid crystal display. The personal and business information contained
10 often includes such information as individual names, company names, addresses, telephone numbers, telefax numbers, E-mail addresses and other wide ranging information.

15 Through advances in storage technology, PDA users compile ever increasingly more information imposing requirements to retrieve specific information rapidly and accurately. However, simply increasing electronic processor speed often taxes available power sources, but, because the
20 devices are required to be small enough to be portable, large power supplies are not feasible. This dual need challenges the designer of this technology to strive for innovative methods for producing the required searches efficiently which calls for improving computer data base
25 search techniques.

A PDA may contain memory storage devices to permit the creation of data bases used in various PDA and telephone applications. For example, the data base may hold contact
30 information, similar to a calling card, such as telephone numbers and addresses. This contact information may be used by the telephone to initiate a telephone call, telefax or E-mail transmission. The PDA can then send and receive message content contained within mediums such as
35 the telefaxes or E-mail and serve as an adjunct to the telephone to provide speakerphone or voice mail capability. As the number of contact entries becomes

2025 RELEASE UNDER E.O. 14176

large it becomes necessary, for practical reasons, to incorporate methods to search the data bases for information the user needs to retrieve.

- 5 To accomplish a search the PDA would have to incorporate software or firmware to properly interpret the search commands, carry out a search algorithm, and display lists of records that meet the search specification. Such methods are generally well known by those person skilled
10 in the computer arts.

For smaller data bases such as are utilized in PDA applications, the approach has been to provide a simple search, where the user activates the search function and
15 types in the search key or designator. The search is performed after the user activates the search by, for example, pressing a key such as enter or a specific 'search' key. This is referred to as a 'passive search' and is characterized by the fact that it does not display
20 the result of the query as soon as the query search key activates the search.

SUMMARY OF THE INVENTION

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The present invention is an apparatus and a method for searching a PDA data base utilizing a search criteria and displaying the result so that the user can determine whether the search yielded the intended result, whether
30 the search needs to be refined, or whether the outcome should be used to initiate a telephone call. After successfully obtaining a specific name and a corresponding calling number, such as a telephone number, a telefax number, or numbers for an Internet server and/or an E-mail
35 address, the numbers are applied to a telephone for establishing a telephone connection. Thereafter, the PDA, utilizing the telephone, links the user to a PSTN or

employs available data transmission capabilities of the wireless network to send telefaxes, short messages, E-mail, or to connect with remote computers.

- 5 In carrying out the invention, a search engine or search application program resident in the PDA memory or firmware cooperates with the PDA, which contains a display for displaying the database information. It also includes an input device such as a keypad, touch screen, or keyboard
10 (referred to collectively as a keyboard), to allow the user to store data and retrieve data in a database, or alter the database, or input various search criteria.

The data base, generally analogized to a telephone book,
15 is referred to as a contact data base where data stored in fields comprises at least a name associated with a particular field in a data base record. Other fields contain addresses, telephone and facsimile numbers, E-mail and paging addresses, Internet universal resource locator
20 numbers, and any other types of calling numbers associated with electronic communications. Because names are primarily what interests the PDA users, the user generally searches the name field, although the user is not precluded from searching other fields such as address
25 fields. The contact data base is also used to select addressees for facsimiles and E-mails as well as to route telephone calls.

- As the user types in the search key, the PDA virtually
30 instantly displays the items matching the search found in the contact data base. The user can refine the search by adding additional search criteria until finally producing for viewing a minimum number of data base records matching the search criteria. For example, if the user types the
35 letter "j" all records having names beginning with the letter "j" appear. The user may continue to type additional letters defining a name, for example, the pair

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containing names and calling numbers; choosing from the stored file records a directory to display searchable data contained in the data base; inputting a search key relatable to a data element in one or more file records; 5 comparing the search key to the data in the file records and displaying in the directory one or more file records in which the data element matches the search key; selecting a file record in accordance with the location of an indicator on a display, denoted by at least one of a 10 cursor, a pointing device or a contact and a selection frame in the display; and finally utilizing the calling number found in the selected file record to initiate an electronic communication to transmit a message content contained within mediums such as a facsimile, E-mail, 15 paging message or voice telephone call.

An object of this invention is to provide an efficient method for searching a PDA database.

20 A second object of this invention is to provide a method whereby a PDA searches a data base for pertinent calling numbers and initiates a telephone call utilizing the numbers.

25 Another object of this invention is to provide a PDA capable of searching a database for pertinent calling numbers and initiating a telephone call utilizing the numbers.

30 BRIEF DESCRIPTION OF THE DRAWINGS

The novel features of the present invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of 35 operation, together with further objects and advantages thereof, may be best understood by reference to the following description taken in conjunction with the

accompanying drawings, in which:

Fig. 1 is a high-level diagram of a PDA.

- 5 Fig. 2A is a frontal view of a telephone unit utilized with a PDA.

Fig. 2B is a perspective view of a PDA unit utilized with the cellular telephone in Fig. 2 A.

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Fig. 3 illustrates a contact card containing the information that is typically summarized for displaying in various directories.

- 15 Figs. 4A-4D illustrate various displays of the telephone directory.

Figs. 5A-5C illustrate various displays of the auxiliary directories.

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Figs. 6A and 6B are a flowchart detailing the sequence following a command to perform a search.

- 25 Figs. 7A and 7B are a flowchart detailing a search engine sequence performed according to a user request to search based on a search key input.

DESCRIPTION OF THE PREFERRED EMBODIMENT

- 30 Fig. 1 is a high-level diagram of a PDA 10 that includes a PDA unit 10b having one or more data input devices 8a and 8b, a contact data base storage unit 11, a contact data base 18, a search engine 14, a display 3 and a device or interface for electronic communication, such as a
35 telephone unit connection 10a.

Fig. 1, blocks 11, 14 and 18 and associated arrows represent functions of the process according to the present invention which may be implemented as electrical circuits and associated wires or data busses, which transport electrical signals. Alternatively, one or more associated arrows may represent communication (e.g., data flow) between software routines, particularly when the present method or apparatus of the present invention is implemented as a digital process as in the preferred embodiment.

Referring to Figs. 2A and 2B, in a presently preferred embodiment the PDA is comprised of the telephone unit 10a and the PDA unit 10b. The telephone unit 10a electrically and mechanically interfaces to the PDA unit 10b on an unshown face of PDA hinged cover 12. In one mode of operation the cover 12 closes the PDA display 3 and keyboard 8b, but the fully integrated telephone unit 10a attached to the cover 12 also permits electronic access to certain functions of the PDA unit 10b, such as its data base through the keypad 8a. The "interface" emphasizes the fact that the telephone unit 10a and the PDA unit 10b use the same resources and essentially cooperate as one device. For example, the telephone unit 10a may use names and phone numbers stored in the data base storage unit 11 to initiate voice telephone calls, sending or receiving telefaxes, or connecting to remote computers. The PDA unit 10b also uses the interface and employs data transmission capabilities compatible with existing wireless networks for communicating with the outside world, i.e. for sending or receiving telefaxes and connecting to remote computers.

Although shown in Figs. 2A and 2B as an integrated phone/PDA unit, in other embodiments of the invention the PDA 10 may have a connector for plugging into a telephone line, or to connect to a separate wireless communicator,

such as a cellular telephone.

The contact data base 18 contains information as illustrated on an exemplary contact card 100 in Fig. 3, constituting business and personal information such as names, addresses, phone numbers, E-mail addresses, and telefax calling numbers. Referring to Fig. 3 the structure of the contact card 100 is comprised of a field ID 101 and a field ID 102 and values, such as a value 103, for illustration. Other items that are typically found in the contact card 100 and related cards, to be described hereinafter, are a cursor 104, a selection frame 105 and an indicator of available options 106.

The contact data base 18 contains the information retrievable by the PDA 10b in performing each of its intended functions. For example, the PDA 10b will display in display 3 various application directories derived from the contact data base 18 such as a telephone directory 200 (Fig. 4A), a telefax directory 300 (Fig. 5A), or E-mail directory 400 (Fig. 5A). The PDA 10b will also display the results of a contact data base 18 search after utilizing the search engine 14 to perform a search on the basis of a search key 21 input. Essentially, the specific information displayed depends on the information the selected user application requires. For example, when making a call via the telephone, the name and the phone numbers of the contact are displayed on display 3. Other information such as possible telefax numbers, E-mail addresses and job titles may not be shown at that time.

In an alternate mode of operation the user can input through the telephone unit 10a keypad 8a a searchable alphanumeric string of characters. By appropriate key selection, the PDA 10b will search its data base and provide information to the telephone unit 10a for establishing a communication link to the outside world

through a direct connection to a PSTN or the wireless network via antenna 13.

The contact application is used to create, edit, delete and manage all information, such as phone numbers and address data. This contact information is used by the telephone 10b in the telephone, telefax, and E-mail applications. The contact directory, unshown, is a list of all contact cards where each contact card 100 can be created, edited, or deleted. In the contact's directory each contact card is listed in alphabetical order according to the name in each contact card 100, as indicated by the Name field ID 101.

Referring to Fig. 2B, the user typically chooses the application or function to be performed by the PDA 10b by pressing one of several application keys 9. In the case where a telephone call is to be made, depressing the telephone key of the application keys 9 produces a telephone directory display. The display 3 then indicates which selection, such as the contact directory, telephone directory 200, telefax directory 300 or E-mail directory 400, has been chosen. Each directory operates in essentially the same manner.

25

The PDA 10b contains, in addition to the application keys 9, a QWERTY standard keyboard 8b for inputting and editing contact information, and navigation keys 2a and 2b for controlling the display selection. In an alternate embodiment the keyboard is replaced by a touch screen with all the same functions that are hereinafter described for the standard keyboard 8b. In another embodiment a voice recognition function can be used to replace or supplement the manual data entry device, such as the keyboard 8b. In Fig. 4A the display option 106, adjacent to option keys 106A (Fig. 2) permits each directory to be utilized in carrying out the specific function. Each directory will

display a different set of options 106. For example, the telephone directory 200 would depict in its display, Call, Enter Number, Recent Calls, and Settings, pertaining to a call to be placed, telephone numbers to be entered manually, a display of recent calls and special telephone feature settings, respectively.

Whenever an application directory, such as the telephone directory 200 is chosen by the user, the information can be highlighted on the display screen 3 by scrolling or moving the selection frame 105 with the navigation keys 2a or 2b.

Referring to Fig. 4A and Fig. 4B, a search field 4 is used to accept keyboard 8b input of a search key 21 based on one of the displayed fields such as the name field 5 or the company field 6. To search for an item of information, such as a specific name, the name is entered using the keyboard 8b into the search field 4. The search engine 14, comprising a software or firmware search engine, compares fields for matches in the name field 5 or company field 6. The search results can be cleared by deleting characters, one by one, from the search field 4 with the backspace key located on keyboard 8b.

25

The search is performed on the name field 5 or the company field 6 contained in each contact record 100, although other search fields could be implemented by those persons skilled in the art. A contact may have a multi-part value, such as 'Jones Andrew', wherein the search will be performed on both names (the space character acting as a separator). The same applies to 'Company' or 'Address' or other possible fields. The search can be performed on any number of fields keeping in mind the resources and processor capability.

The result of the query is sorted alphabetically and displayed on display 3 in the following order: sorted, (1) according to the first separate word in the 'Name' field; (2) according to the second separate word in the 'Name' field; (3) according to the third separate word in the 'Name' field; (4) according to the nth separate word in the first 'Name' field; (5) according to the first separate word in the first 'Company' field; (6) according to the second separate word in the first 'Company' field; or (7) according to the nth separate word in the first 'Company' field.

Thereafter depending on the levels of search embodied in the particular PDA 10b, query results are displayed sorted: (1) according to the first separate word in the first 'Address' field; (2) according to the second separate word in the first 'Address' field; (3) according to the third separate word in the first 'Address' field; or (4) according to the nth separate word in the first 'Address' field, etc.

Fig. 4B illustrates a telephone directory 200 where a search character 21 depicted as "a" is provided. Note that all individual names 22a, such as Andrew and the company names 22b, such as AA Companies, Inc., beginning with the letter "a" are matched and thereby retrieved in the search and displayed at one time. Fig. 4C illustrates a search on the characters 21 depicted as "an" and Fig. 4D illustrates no matching contacts when the characters 21 depicted as "anx" are searched.

Fig. 5A and Fig. 5B are further examples of other applications utilizing the same contact data base 18. The telefax directory 300 illustrated does not have any telefax numbers at the time of the search, but it will nevertheless be displayed to the user because the search key 21 depicted as "an" shows a match. However, as shown

in Fig. 5B, two of the contacts 28 do not have an E-mail address, but each will be visible to the user on the display 3 at a reduced illumination level, dimmed, or otherwise visually distinguished.

5

A World Wide Web (WWW) link may also be provided in a contact card 100. By example, by providing a WWW field, e.g. WWW(Homepage):http://www.myserver.net/myhomepage.htm, a user may initiate a data call to an internet access point and automatically retrieve (load, fetch) the page stored in that field, http://www.myserver.net/myhomepage.htm. A gopher link can be provided as well, and/or a FTP (file transfer protocol) link.

15

Referring again to Fig. 2B, the user chooses a message content application such as the E-mail application or the facsimile application by pressing one of the application keys 9. For example, in the case where an E-mail is to be sent, depressing the Internet key of the application keys 9 produces on display 3 an instruction to the user to type the E-mail information or message content. The user will then type the message content using keyboard 8b, which content is displayed on the display 3. When the message content is ready to be sent, the user selects a recipient from the E-mail directory 5B. Recall that the contact data base 11 is also used to select addressees for message content such as facsimiles and E-mails as well as to route the electronic communications or telephone calls. The user can then send the E-mail immediately or can delay the sending to a later time, in either case using the same contact data base 11 to acquire the E-mail address. If the sending is delayed the PDA 10b creates a temporary file to store the E-mail, where it will be later retrieved, when the user desires to send the message.

35

An alternate method for operating the PDA 1 comprises the steps of: storing in the data base 11 one or more records of names and relatable calling numbers comprising a directory; choosing an application using the application
5 keys 9 to input either a facsimile or E-mail content as described above; selecting a record from either the facsimile directory 300 or E-mail directory 400 and then utilizing the information in the selected record to address the facsimile or E-mail.

10

Figs. 6A and 6B are a flowchart detailing the sequence following the command to perform a search. This flowchart accepts the user actions and forwards user input to the search subroutine.

15

The search process begins at Block 701 with the user choosing a name to search for purposes of making a call or sending a telefax or E-mail. Search variables 702 are set by designating search key 21 symbolically as Key\$, the
20 alphanumeric string representing the selected name, provided by user input, through the keyboard 8b and appearing at the search field 4. For illustration purposes, cursor 104 defines variable loc(x), located within the search field 4. Alternatively the location of
25 the cursor may be replaced by any indicator on a display, so long as it can be denoted by a cursor, pointing device or contact such as touch. The selection frame 105 defines the variable loc(y) in the input field and initially is set to one so that the currently active record will be the
30 first record searched.

A reentrant subroutine 703, Figs. 7A and 7B, to be described below, is called transferring the variable Key\$ to the subroutine as a parameter. When the process is
35 first called, the variable Key\$ is designated as a NULL string, indicating that every match should be matched and therefore displayed.

"030334-0249"

At decision Block 704, the keyboard 8b is tested for whether a key has been depressed. If a key has been depressed, control is forwarded, conditionally, to decision Blocks 705, 706, 707, 708, 709 and 710 for determination of which navigation key 2b or other key on keyboard 8b may have been depressed. In the case where no key has been depressed, the PDA 10b processor continues to test for the depression of a key on the keyboard 8b.

10

Block 705 tests the condition whether the user has depressed one of the group of navigation keys 2b, referred to as the 'backspace' key and if the condition is satisfied, logical control is forwarded to Block 714. At Block 714, unless the cursor 104 is at the beginning of the line, it deletes the character left of the cursor 104 in the search key 21 string and then moves the cursor 104 left one place. IF the condition has not been satisfied then control is passed to Block 706 for further checking.

20

Block 706 tests the condition whether the user depressed one of the group of navigation keys 2b, referred to as the 'left arrow' key, and if the condition is satisfied, logical control is forwarded to Block 715. Unless the cursor 104 is at the beginning of the line, the cursor 104 is moved left one place, otherwise it is left unchanged. If the condition has not been satisfied, then control is passed to Block 707 for further checking.

30

Block 707 tests the condition whether the user depressed one of the group of navigation keys 2b, referred to as the 'right arrow' key, and if the condition is satisfied, logical control is forwarded to Block 716. Unless the location of the cursor 104 is at the right end of the search key 21. The cursor 104 is moved one place to the right, otherwise it is left unchanged. If the condition had not been satisfied then control is passed to Block 708

35

Block 709 tests the condition whether the user depressed one of the group of navigation keys 2b, referred to as the 'down arrow' key, and if the condition is satisfied, logical control is forwarded to Block 718. Unless the selection frame 105 is at the last line, the selection frame 105 is moved on line down, otherwise it is left unchanged. If the condition has not been satisfied, then control is passed to Block 710 for further checking.

Block 710 tests the condition whether the user has depressed a special key, e.g. a key assigned to switch applications. If the condition is satisfied, then control is passed to Block 719 to exit the search routine 703 and return to the application prior to activation the search, otherwise control is passed to Block 711 where the character depressed is displayed. Through Block 712 the character is also added to the search key 21 and then placed in front of the cursor. The cursor 104 location and thereby loc(x), is advanced and the process of searching the contact data base 18 begins again.

Figs. 7A and 7B are a flowchart detailing how the search engine searches in accordance with the present invention. In summary the search process comprises the following steps: inputting a search key representing the alphanumeric string to be searched; setting a first

variable to the number of records to be checked; setting a first index to one to keep account of the records checked; setting a second variable to the alphanumeric string to be searched; setting a third variable to TRUE if the record
5 has been checked otherwise setting the third variable to FALSE, and if the third variable is FALSE then reading the second variable from the record; comparing the condition whether the search key matches the second variable stored in the record, and if it is determined that the search key
10 matches the second variable, then, the record is displayed; incrementing the first index and determining whether the first index equals the first variable number of records to be checked, and if the first index does not equal the first variable, then the search process repeats
15 until all records matching the search key are displayed.

In describing the search function in detail we begin at Block 801 when the subroutine 703 is called from the process described in Figs. 6A and 6B and is passed search
20 key 21 parameter Key\$, the alphanumeric string representing the selected name, address, or other pertinent data to be searched. In Block 802 if the search criteria is determined to be a null string, then the search is effectively aborted by setting the variable
25 "matched" to the total number of records in the data base, making them available at the display 3 and exiting the search routine 703. As no search key has been provided, all records will be shown.

30 At Block 817 the variable "matched" is set to the number of all records in the database 18 which variable value is then passed to Block 718 in Fig. 6.

If the string to be compared with records in the database
35 18 and thereby searched is not the null string, then the process is passed to Block 803.

At Block 803 an index "record" is set to one and the index "matched" is set to zero. The variable "field ID" is set to Name and the variable "Match(record)" is initially set
5 to FALSE. This causes the condition at Block 804 to be satisfied, which in turn reads the field value from the active record in Block 805.

Block 804 determines if a record should be compared based
10 on whether the current record has already been checked. If "match(record)=TRUE", then the current record is skipped and the process jumps to Block 811 where the "record" index is incremented by one, otherwise Block 805 reads the field value according to the variable "field ID"
15 from the active record.

Block 806 effectively places the cursor 104 at the beginning of the field value in order to set the start point of the field to be checked.
20

Block 807 first calculates the length of the search key 21, symbolically Key\$, and then selects, starting from the current search position, the next character according to the length of search key 21.
25

Block 808 tests the condition whether the selected string compares or matches the value stored in the search key 21, symbolically Key\$, and if it is determined that it does compare, then, the process moves to Block 809, otherwise
30 the process moves to Block 818.

A separation character is a pre-defined character intended to separate words in the field value location. Characters such as quotes or hyphens as in "Adolfson Jack" or
35 "Twinsor-Jockston" are permissible. If a separation character is found, then the match comparison is performed on the search string following the separation character.

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If it is determined that the character is not a separation character, then the record is determined not to be a match and the process advances to the next record.

5 If the test in Block 808 determines a match between the search key 21 and a field value, then Block 809 increments the index "matched" by one, sets the variable "match(record)" to TRUE (preventing the record from being searched again), and passes the process to Block 810 where
10 the favorably compared record is added to a temporary list labeled "ToBeShownList".

Depending on limitations imposed by available memory, memory configurations, or hardware, several temporary
15 "ToBeShownList" lists can co-exist. This has the advantage that several files can be created if the data base, which may contain hundreds of matched records, does not fit in one temporary list. When more than one ToBeShownList exists, subsequent searches can be performed
20 from existing temporary lists instead of the contact data base 18. This typically results in efficiencies of search speed. For example, consider that a search has previously been processed on the letter "A" and a ToBeShownList has compiled all records that have an "A" in the 'Name' field.
25 Subsequently, if the user types in a search key "As", the search only need be conducted on the previously compiled ToBeShownList, not the entire contacts data base 18. Although, the embodiment illustrating this technique is not shown in the Fig. 7 flowchart, it will be understood
30 as easily implemented by persons skilled in the arts, based on the foregoing description.

At Block 811 the index "record" is incremented by one so as to point to the next record to be checked. However, before another record is retrieved, Block 812 tests the index "record" against the number of records in the data base represented by the variable "numrecords". If the

index "record" is less than "numrecords" then the next record in the data base 18 is checked.

After all records have been checked for a match in the first field ID 5, then the process determines if another field such as field ID 6 needs to be searched, also, Block 813 reads the next field ID to determine if the next field, within a record, is to be compared for a match. IF there is no other field to be compared to the search string, then the index "record" is reset to one, the variable "match(records)" is reset FALSE, and the process beginning at Block 804 is repeated on the new field.

If no additional fields are to be compared against the search key 21, then the Block 814 passes control to Block 815 to combine any temporary lists created. Thereafter, the sorted lists are displayed as shown by Block 816. If no matches were found the system displays the message that no matches were found. Block 820 returns the control to the calling routine 703.

Further, in accordance with this invention, a telephone number obtained from the above-described search procedure can be transferred to the telephone 12 shown in Fig. 2A, thereby enabling a call to be placed to the desired party.

The number is transferred to the internal data bus of the telephone 12 using a format and protocol that is compatible with the internal data bus.

While preferred embodiments of the invention have been shown and described herein, it will be understood that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will occur to those skilled in the art without departing from the spirit of the invention. Accordingly, it is intended that the appended claims cover all such variations as fall within the spirit and scope of the invention.

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utilizing information in the selected record to initiate one of a plurality of forms of electronic communication to a selected recipient.

2. The method as described in claim 1, wherein comparing the search key comprises the steps of:

5 inputting a search key representing the alphanumeric string to be searched;

 setting a first variable to the number of records to be checked;

10 setting a first index to one to keep account of the records checked;

 setting a second variable to the alphanumeric string to be searched;

15 setting a third variable to TRUE if the record has been checked otherwise setting the third variable to FALSE, and if the third variable is FALSE then reading the second variable from the

20 record;

 comparing the condition whether the search key matches the second variable stored in the record, and if it is determined that the search

25 key matches the second variable, then, the record is displayed; and

 incrementing the first and determining whether the first index equals the first variable number of records to be checked and if the first index

30 does not equal the first variable, then the search process repeats until all records matching the search key are displayed.

35 3. A method for operating a personal digital assistant having an input means, a file storage means, a data base, a search engine means; a display means, and an

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an input means for inputting a search key
relatable to a datum element in one or more said
records;

5

a search engine to search the data base and
compare the records to the search key;

10

a display for showing the directory of said
records that compare to the search key;

an input means to select a calling record in the
directory; and

15

an electronic communication means connected to
the personal digital assistant to initiate one
or more applications relatable to an electronic
communication of a message content based on a
description of the record selected.

20

7. The personal digital assistant device as in Claim
6, wherein the input means to select a calling record in
the directory is comprised of a QWERTY keyboard.

25

8. The personal digital assistant device as in
Claim 6, wherein the input means is comprised of a
telephone keypad.

30

9. The personal digital assistant device as in
Claim 6, wherein the input means is comprised of a touch
screen.

35

10. The personal digital assistant device as in
Claim 6, wherein the input means is comprised of a voice
recognition means.

11. The personal digital assistant device as in
Claim 6 wherein the recipient electronic communications
descriptors include at least one of a telephone number, a
facsimile number, an E-mail address, a paging address,
5 and an Internet IP address.

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A PERSONAL DIGITAL ASSISTANT WITH
REAL TIME SEARCH CAPABILITY

5

ABSTRACT

The present invention is a method and an apparatus for searching a personal digital assistant (PDA) data base utilizing a search criteria and displaying the result so that the user can determine whether the search yielded the intended result, whether the search needs to be refined, or whether the outcome should be used to initiate an electronic communication such as a telephone call. After successfully obtaining the specific name and recipient information, such as a telephone number, telefax number, numbers for an Internet server and related E-mail address, the numbers may be applied to a telephone for establishing a PSTN or telephone connection. Thereafter the PDA, utilizing the telephone unit links the user to a line or employs data transmission capabilities of a wireless network to send telefaxes, short messages, E-mail and to connect with remote computers. Using a keyboard the user can store data in a data base, alter the data base and input search criteria. The directory is similar in appearance to a telephone book listing where the information comprises at least a name and telephone number or address associated with a particular field in a data base record. Because names are primarily what interests the personal digital assistant users, searches based on the name field typically yields related phone numbers and other record data, although the user is not precluded from searching on other types of information.

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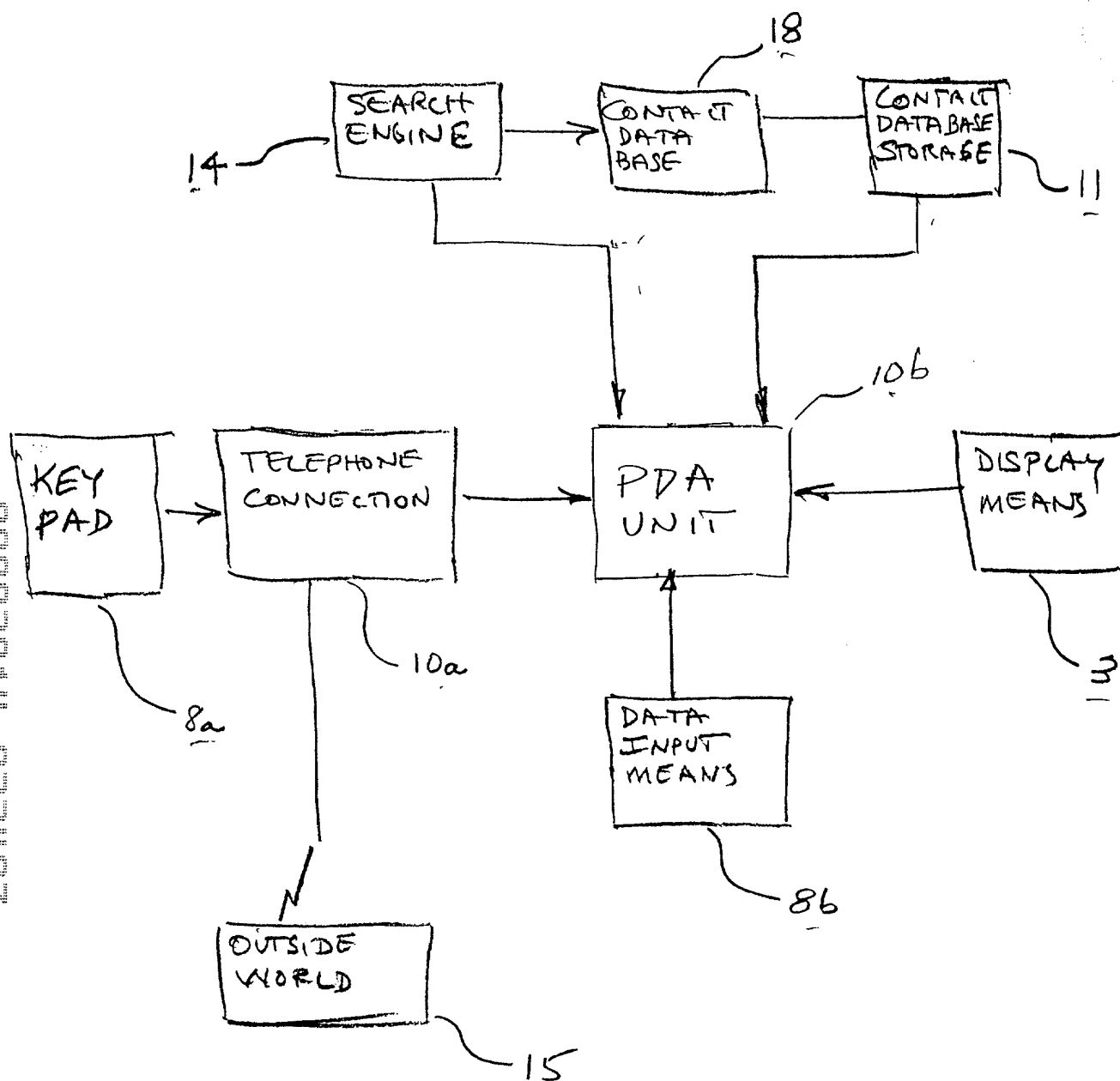


FIG. 1

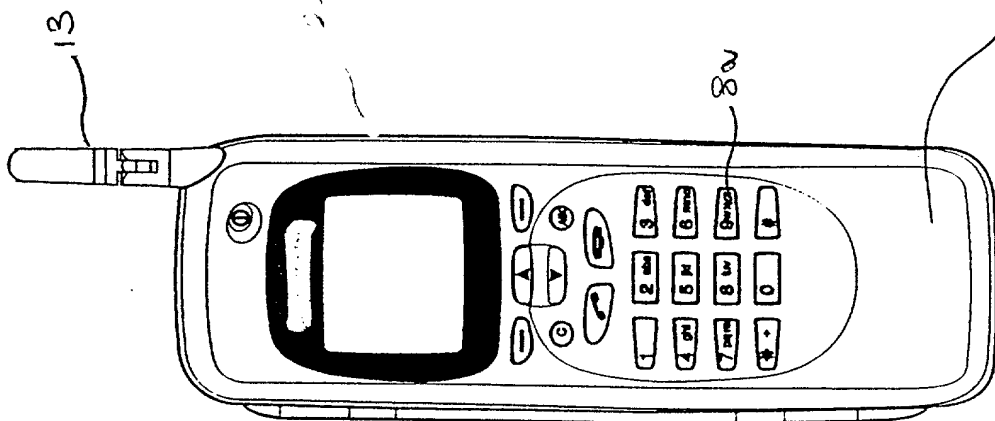


Figure 2A

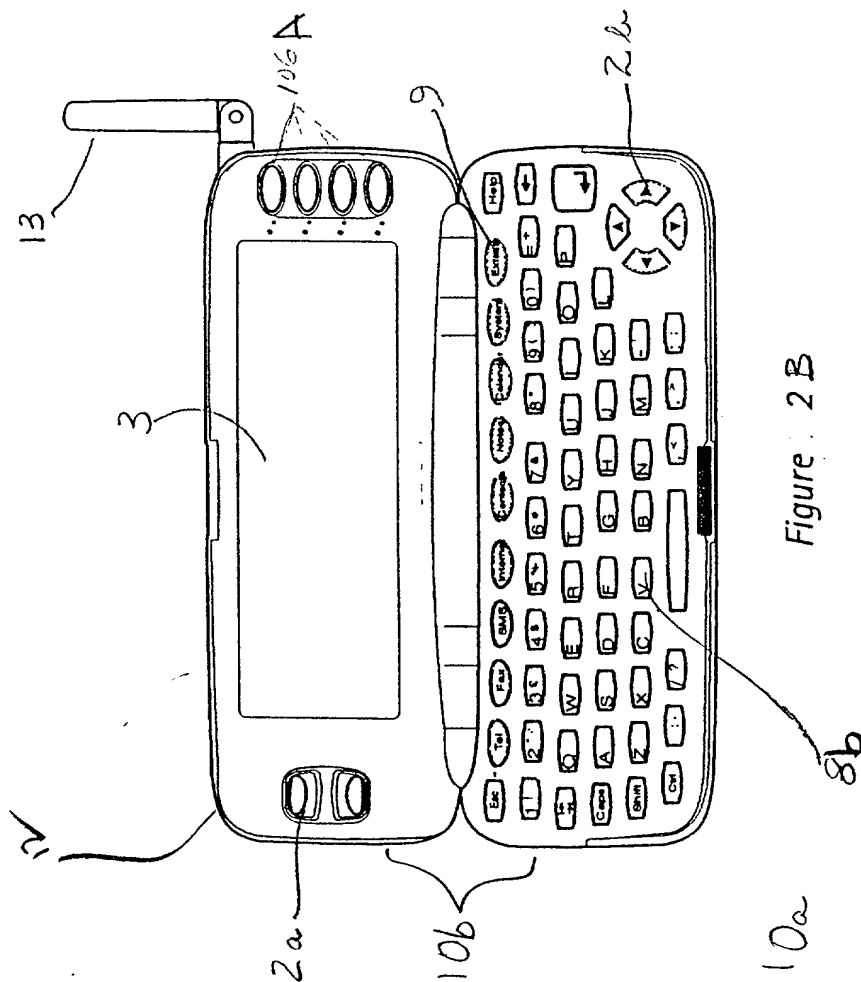


Figure 2B

Contact card

Name: Anderson Pieter

Company: Pick Ltd.

Job Title: Sales Manager

Address: Hikivuorenkatu 33B33, 64553, Kihniö, Finland

Tel(GSM): +358-50-66542 **Tel(Work):** +358-10-66542

Fax(GSM): +358-51-66542 **Fax(Work):** +358-11-66542

E-Mail(Work): pieter.anderson@pick.com

DTMF(Voice mailbox): #54663p6745p2p1*

Fields

Speed dials

Delete card

Close

Fig. 3 Contact Card structure

Fig.³ Contact Card structure

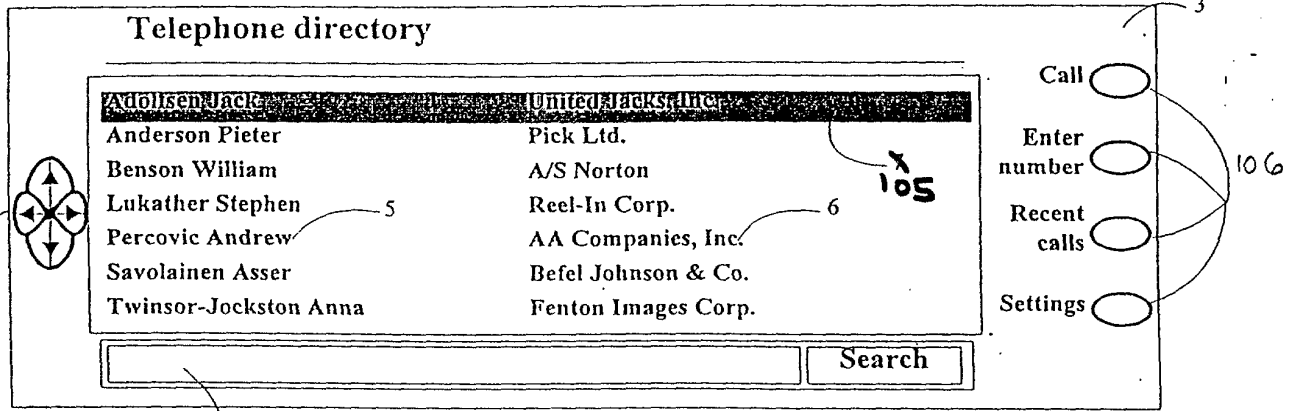


Fig. Telephone directory, sorted by Name field

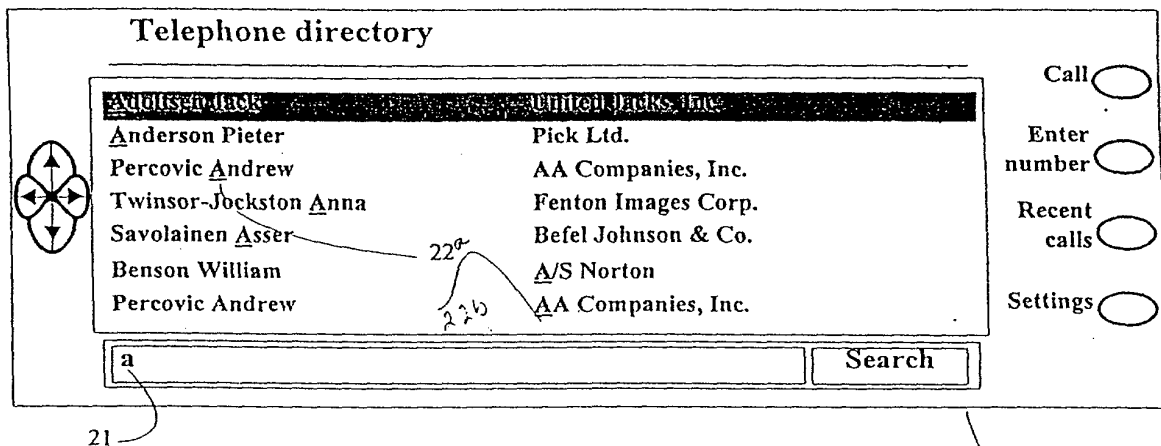


Fig. One search key character has been provided

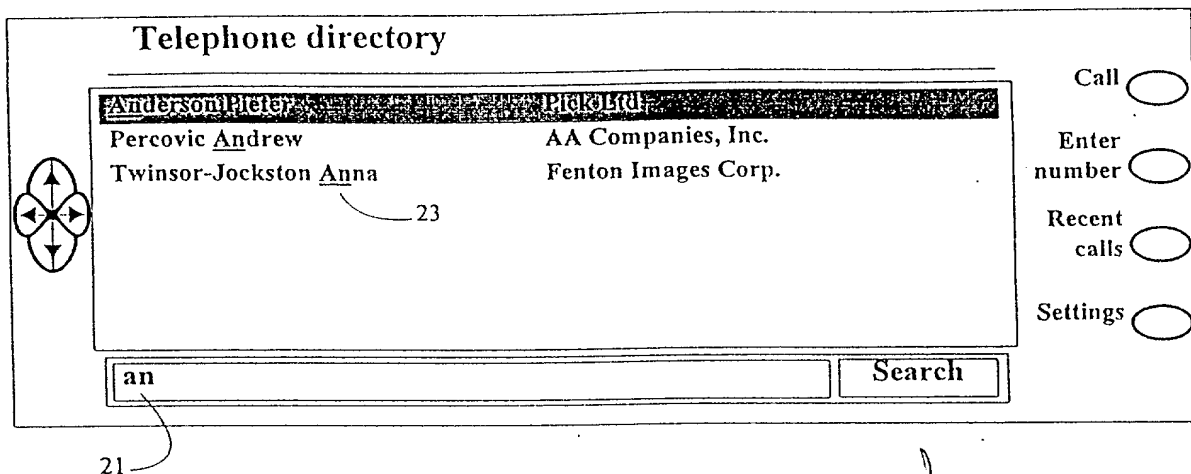


Fig. 20 Two search characters has been provided

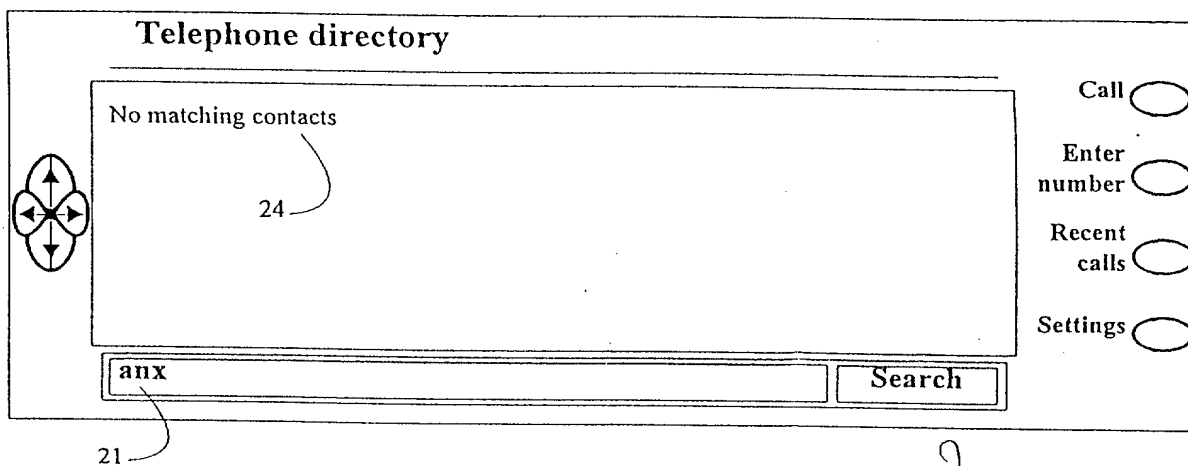


Fig. 21 No matching contacts

Telefax

Anderson, Peter	McL, Ltd.
Percovic, Andrew	AA Companies, Inc.
Twinsor-Jockston, Anna	Fenton Images Corp.

25

Call

Enter number

Recent calls

Settings

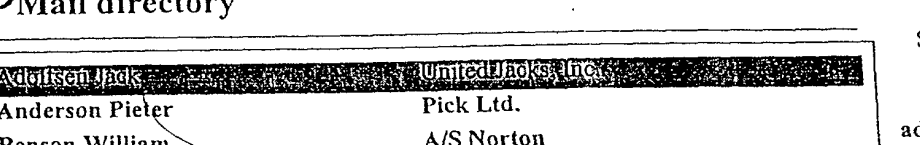
an

21

One matching contact does not have telefax number specified

300

FIG. 5A



E-Mail directory

Adoffsen Jack	United Jinks, Inc.
Anderson Pieler	Pick Ltd.
Benson William	A/S Norton
Lukather Stephen	Reel-In Corp.
Percovic Andrew	AA Companies, Inc.
Savolainen Asser	Befel Johnson & Co.
Twinsor-Jockston Anna	Fenton Images Corp.

28

Select ☐

Enter address ☐

Cancel ☐

Search

E Mail directory, sorted by Name field

2400

FIG. 5B

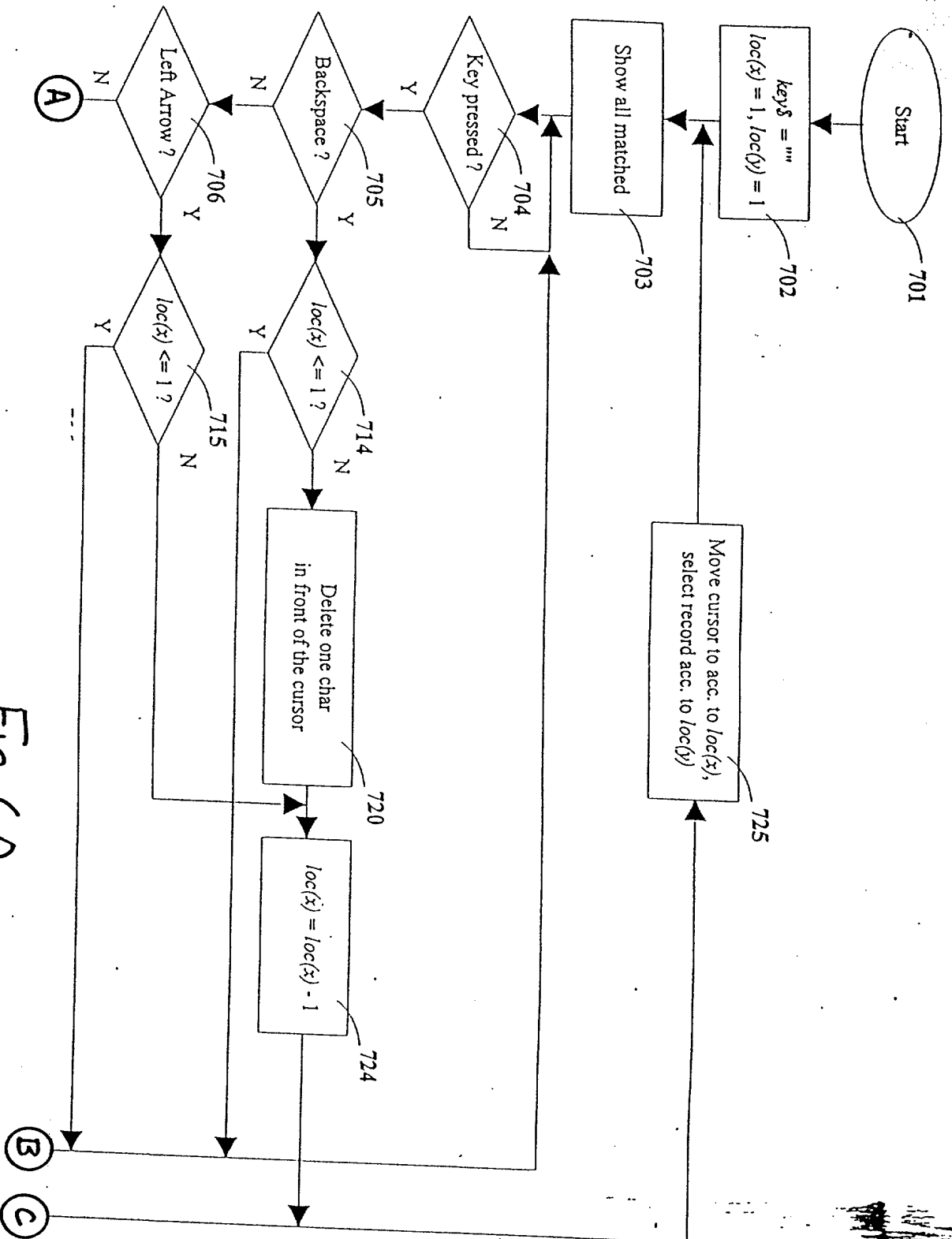


FIG. 6A

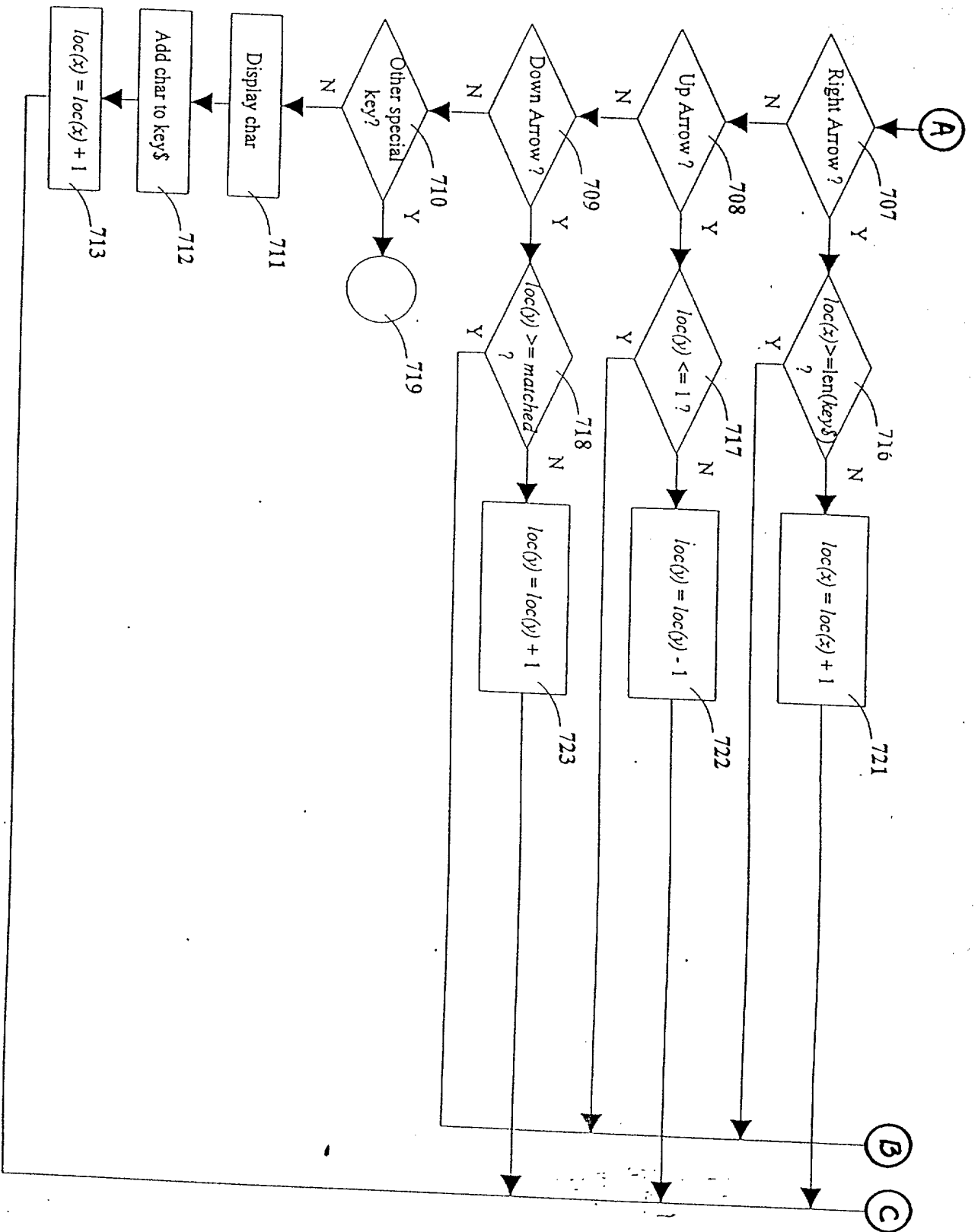


FIG. 6B

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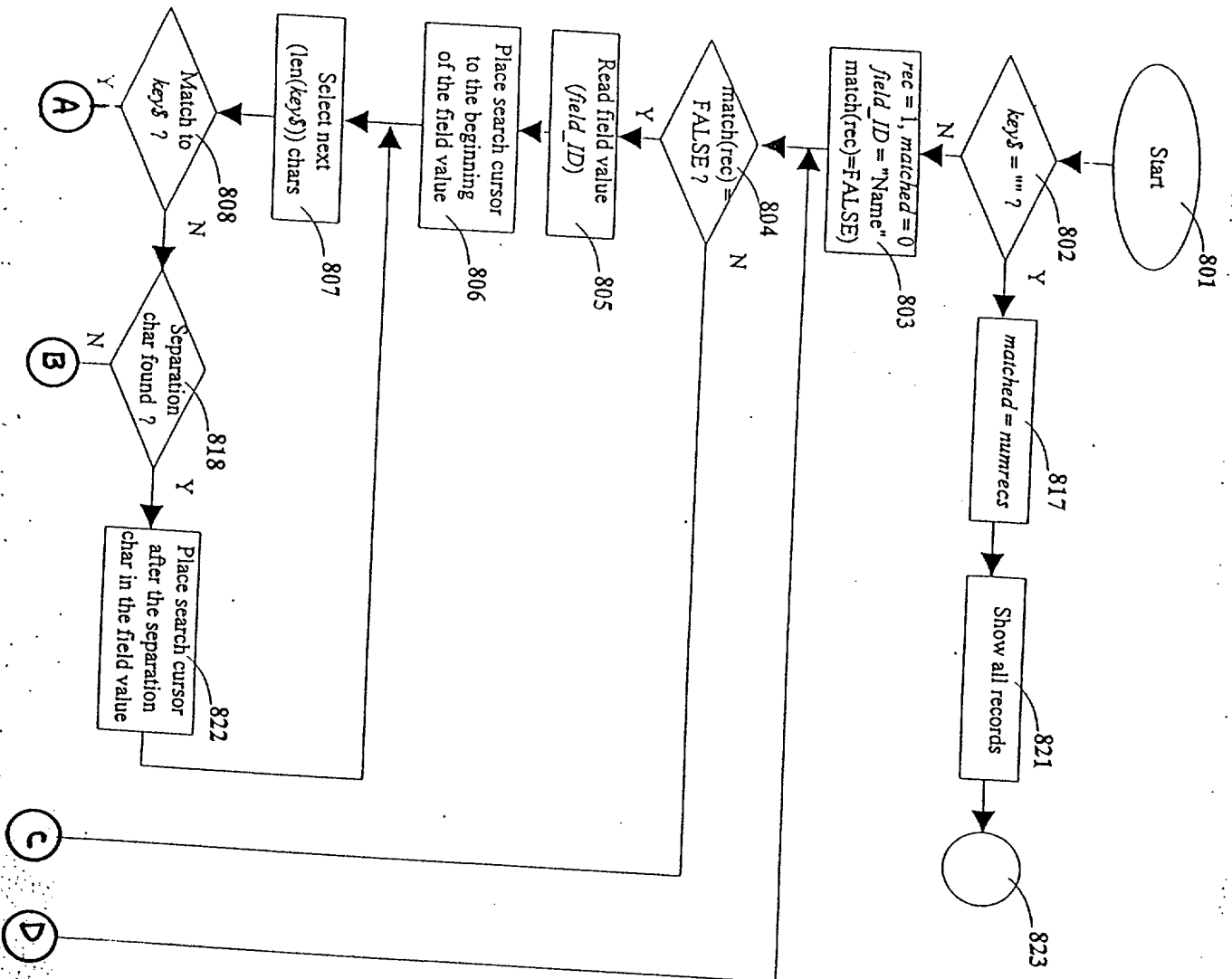
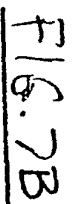


FIG. 7A

[illegible]

COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,
CONTINUATION OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

- ☒ original.
- ☐ design.
- ☐ supplemental.

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

- ☐ national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach **ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P**.

- ☐ divisional.
- ☐ continuation.
- ☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name.
I believe that I am the original, first and sole inventor (if only one name is listed below) or
an original, first and joint inventor (if plural names are listed below) of the subject matter
that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

A Personal Digital Assistant With Real Time Search Capability

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b) or (c))

- (a) ☒ is attached hereto.
- (b) ☐ was filed on _____, as ☐ Serial No. 0 / _____
or ☐ Express Mail No., as Serial No. not yet known _____
and was amended on _____ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

- (c) ☐ was described and claimed in PCT International Application No. _____, filed on _____ and as amended under PCT Article 19 on _____ (if any).

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

- ☒ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
- ☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

- (d) ☒ no such applications have been filed.
- (e) ☐ such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

____ / _____
____ / _____
____ / _____

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. 120**

- ☐ The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P) APPLICATION.

264220-1190000

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete **ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION** for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Clarence A. Green	(24,622)
Mark F. Harrington	(31,686)
Harry F. Smith	(32,493)

(check the following item, if applicable)

- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO
Harry F. Smith, Esq.
PERMAN & GREEN, LLP
425 Post Road
Fairfield, CT 06430

DIRECT TELEPHONE CALLS TO:
(Name and telephone number)

Harry F. Smith
(203) 259-1800

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor

Lasse _____ Siitonen _____
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)
Inventor's signature *Lasse Siitonen*
Date 20-Feb 1997 Country of Citizenship FINLAND
Residence JANKANZATTI 15 A 26
Post Office Address 33700 TAMPERE FINLAND

Full name of second joint inventor, if any

Risto _____ Ronkka _____
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)
Inventor's signature *Risto Ronkka*
Date 18-Feb 1997 Country of Citizenship FINLAND
Residence KOULUKATU 15-17 A 8
Post Office Address 33200 TAMPERE FINLAND

Full name of third joint inventor, if any

(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)
Inventor's signature _____
Date _____ Country of Citizenship _____
Residence _____
Post Office Address _____

264230-4780330

(check proper box(es) for any of the following added page(s)
that form a part of this declaration)

☐ **Signature** for fourth and subsequent joint inventors. Number of pages added _____

. . .

☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added _____

. . .

☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. Number of pages added _____

. . .

☐ Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

. . .

☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

☐ Number of pages added _____

. . .

☐ Authorization of attorney(s) to accept and follow instructions from representative.

. . .

(if no further pages form a part of this Declaration,
then end this Declaration with this page and check the following item)

☒ This declaration ends with this page.